**COMPUTER ARCHITECT**

**The definition of computer**
Computer is device formed of electronic circuits, electronic cards & Microprocessor to perform exact calculations & Engineering, Numerical & Logical Analysis faster than man.

**Another definition of computer**
Computer is device formed of input Devices to process problem & commands in central processing units to get data that reaches user by an output device.

**Computer types**
1. Digital Computer: which mostly use in all types
2. Analog Computer: in which it deals with properties (voltage, temperatures)
3. Hybrid Computers: it is mix of the analog & digital computer

**Digital Computer Types**
1. Micro –Computer
2. Mini –Computer
3. Mainframe –computer
4. Super computer

**Micro Computer Types**
1. PC in which it has no hard disk
2. PC/XT in which it has single user
3. PC/AT in which it have both single & multi-user

**PC/AT types**
1. Desktop
2. Laptop
3. Palm Top

**Computer properties**
Computers properties are
1. Accurse :to reduces error to the least through data
2. Speed : to be fast in solving difficult problems
3. Storage : the ability to store data in memory
4. Cost: Must be at lowest cost
**Computer Architect**

Computer consist of

1. Hardware
2. Software

**1-Hardware**

Hardware functions

1. Inputting data & program through input devices
2. Saving data & programs in storage device
3. Handling data by applying program commands in the central processing units
4. Showing results to user by output device

Hardware consist of

1. Input devices
2. Central processing unit (CPU)
3. Output devices
4. Storage Unit

**1-1 Input devices**

It's the devices that enters data & command to the computer to the CPU for example (*Keyboard, mouse, scanner, Joy pad, touching pen, Electronic board, digitizer*)

1. Keyboard: A device contain keys a bout 102 represent letters & numbers in addition to a special commands
2. Mouse: A device resemble the mouse contain 3 buttons and a scroll it works in the appearance of cursor, moving the cursor to an icon and clicking on it by any buttons
3. Scanner: Scanner is an input device that insert photograph pictures into the computer, there are two types on scanner the other type of scanner is (OCR) it can transfer documents contain text to word processing text
4. Touching pen: This type is used by engineers The pen draws on screen object it sends pluses to the computer
5. Electronic board: This type is also used by engineers the pen draws on board object it sends pluses to the computer
6. Digitizer: This type is also in engineering application it resemble the mouse but with a lens The lens moves on special board around the object it sends singles to the computer

**1-4 Output devices:** These are devices that show results to users

There are two types of output device soft Copy For example (Monitor) & Hard Copy for example (Printer, Plotter)

1. Monitors: It is an output device that shows data & graphics on screen resolution of screen is adjusted through a video adapter that controls resolutions of the images
2-Printers: in which results are shown on papers printers are dot matrix printers letter quality printers, laser printers, ink jet printers, laser jet printers

<table>
<thead>
<tr>
<th>Lesar printers</th>
<th>Dot matrix, letter quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Less noise</td>
<td>1. Very noise</td>
</tr>
<tr>
<td>2. High resolution</td>
<td>2. Low resolution</td>
</tr>
<tr>
<td>3. Faster</td>
<td>3. Slow</td>
</tr>
<tr>
<td>4. Paper quantity more</td>
<td>4. Quantity less</td>
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3-Plotters: these devices are used to show engineering drawing on large size papers objects are drawn by a number of pens in different colors

Communication Devices
These are devices to connect computer to network either by
1- Through cards that links computer by telephone lines to network (modems)
2- Through cards that link to wireless station Via Antenna network (LAN Cards)

1-2Central Processing Units (CPU)
This is the most important unit in the computer, the data that entered through input devices is processed there it contain and it also executes program

1-Arithmetic & Logical Unit (ALU): this unit performs calculations & Analysis Numerically & logically it takes decisions draw comparison simple & complicated it work due to digital systems

2-Control Unit: this unit performs controls processing organizing data input & output & organizing the process on the other units.

3-Memory unit: this unit temporarily stores program while it worked and data, it contain cells of storage its known as Random Access Memory (RAM). It is a volatile memory (ie it losses what contains when electrical power off)

1-3 Storage Device: this unit stores program while it does not work or data it is known as Read Only Memory (ROM), storage capacity is measured by bytes it is a volatile memory (ie it does not losses what contains when electrical power off)
1 byte = 8 bit
1 kilo byte = 1024 byte
1 mega byte = 1024 kilo byte
1 giga byte = 1024 Mega Byte
1 tera byte = 1024 giga byte

There are two types of storage devices
1- **primary storage device**: **Hard disk**

Hard disk: hard disk is non removable disk drive assembly with a built in data storage, data are stored on magnetized aluminum surface in which are vertically stacked positioned, data are transferred through hard disk head, the hard disk drive are sealed so that the internal components are not exposed to dust, hair, smoke & dirt, maximum storage is 500 Gb

2- **secondary Storage Devices**: *(Floppy, CD-ROM, DVD, Flash Memory)*

The storage devices are connected to computer through devices (peripheral hardware) these are called drivers the disk are inserted into drivers to enable to store data through hard disk, the process of transferring data between computer & disks are called reading and writing, the computer can write data to disk through RAM, the types are

1- **Floppy disk**: a magnetic disk made of silicon 3.5 inch diameter 1.44 Mb of storage

2- **Compact Disk (CD-ROM)**: a disk made of composite material disk, data are written through burning from a laser cell 700 Mb storage the data can not be erased

3- **Re-writable Disk (CD-RW)**: a disk made of composite material disk, data are written through burning from a laser cell 700 Mb storage the data can be erased

4- **Digital Varsity disk (DVD)**: a disk made of composite material disk, data are written digitally through burning from a laser cell 8.4 Gb is maximum storage the can not be erased

5- **Re-Writable Digital Varsity disk (DVD-RW)**: a disk made of composite material disk, data are written digitally through burning from a laser cell 4.7 Gb are the maximum storage the data can be erased

6- **Flash memory**: these are sticks connected to computer through ports called universal serial bus (USB) data are written through these ports and data can be erased from the stick 8 Gb are maximum storage

7- **Blue ray disk**: this a disk storage capacity 21.4 Gb data are written through a new laser technology

**Computer Advantage**

1. Speed
2. Accuracy
3. Memory Capacity
4. Absence Of Monotony

**Computer Disadvantage**

1. No IQ
2. No Instance or Emotions
Architecture

**Output Devices**
- Monitor and printer

**Input Devices**
- Mouse, keyboard, digital cameras, etc.

**Communication Devices**
- Modem, and network interface card

**Central Processing Unit (CPU)**
- Executes programs
- Contains ALU and registers

**Random Access Memory (RAM)**
- Temporarily stores program instructions and data.
- Series of cells each 4 bytes = 8 bits
- Volatile memory

**Storage Devices**
- Floppy discs, tape, hard drive, and CD-ROMs
- Gigs
- Non-volatile memory